VIRAL HEMORRHAGIC FEVERS

RIFT VALLEY FEVER

Rift Valley fever (RVF) is an acute, fever-causing viral disease that affects domestic animals (such as cattle, buffalo, sheep, goats and camels) and humans. RVF is most commonly associated with mosquito-borne epidemics during years of unusually heavy rainfall.

The disease is caused by the RVF virus, a member of the genus *Phlebovirus* in the family Bunyaviridae. The disease was first reported among livestock by veterinary officers in Kenya in the early 1900s.

RVF generally is found in regions of eastern and southern Africa where sheep and cattle are raised, but the virus also exists in most countries of sub-Saharan Africa and in Madagascar. In September 2000, a RVF outbreak was reported in Saudi Arabia and subsequently in Yemen. These cases represent the first Rift Valley fever cases identified outside Africa.

RVF virus primarily affects livestock and can cause disease in a large number of domestic animals (this situation is referred to as an "epizootic"). The presence of an RVF epizootic can lead to an epidemic among humans who are exposed to diseased animals. The most notable epizootic of RVF, which occurred in Kenya in 1950 and 1951, resulted in the death of an estimated 100,000 sheep. In 1977, the virus was detected in Egypt (probably exported there in infected domestic animals from Sudan) and caused a large outbreak of RVF among animals and humans. The first epidemic of RVF in West Africa was reported in 1987 and was linked to construction of the Senegal River Project. The project caused flooding in the lower Senegal River area and altered interactions between animals and humans, resulting in transmission of the RVF virus to humans.

An epizootic of RVF generally is observed during years in which unusually heavy rainfall and localized flooding occur. The excessive rainfall allows mosquito eggs, usually of the genus *Aedes*, to hatch. The mosquito eggs are infected naturally with the RVF virus, and the resulting mosquitoes transfer the virus to the livestock on which they feed. Once the livestock is infected, other species of mosquitoes can become infected from the animals and can spread the disease. In addition, it is possible that the virus can be transmitted by other biting insects.

Humans can get RVF as a result of bites from mosquitoes and possibly other bloodsucking insects that serve as vectors. Humans also can get the disease if they are exposed to either the blood or other body fluids of infected animals. This exposure can result from slaughtering or handling infected animals or by touching contaminated meat during the preparation of food. Infection through aerosol transmission of RVF virus has resulted from contact with laboratory specimens containing the virus.

RVF virus can cause several different disease syndromes. People with RVF typically have either no symptoms or a mild illness associated with fever and liver abnormalities. In some patients,

however, the illness can progress to hemorrhagic fever (which can lead to shock or hemorrhage), encephalitis (inflammation of the brain, which can lead to headaches, coma or seizures) or ocular disease (diseases affecting the eye). Patients who become ill usually experience fever, generalized weakness, back pain, dizziness and extreme weight loss at the onset of the illness. Typically, patients recover within two days to one week after onset of illness.

The most common complication associated with RVF is inflammation of the retina (a structure connecting the nerves of the eye to the brain). As a result, about 1 percent to 10 percent of affected patients may have some permanent vision loss.

Approximately 1 percent of humans that become infected with RVF die of the disease. Case-fatality proportions are significantly higher for infected animals. The most severe impact is observed in pregnant livestock infected with RVF, which results in abortion of virtually 100 percent of fetuses.

There is no established course of treatment for patients infected with RVF virus. However, studies in monkeys and other animals have shown promise for ribavirin, an antiviral drug, for future use in humans. Additional studies suggest that interferon, immune modulators and convalescent-phase plasma may also help in the treatment of patients with RVF.

For more information, call the North Dakota Department of Health at 701.328.2378.